Short Communication

Affective temperament, attachment style, and the psychological impact of the COVID-19 outbreak: an early report on the Italian general population

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ARTICLE INFO

ABSTRACT

The outbreak of COVID-19 is severely affecting mental health worldwide, although individual response may vary. This study aims to investigate the psychological distress perceived by the Italian general population during the early phase of the COVID-19 pandemic, and to analyze affective temperament and adult attachment styles as potential mediators. Through an online survey, we collected sociodemographic and lockdown-related information and evaluated distress, temperament, and attachment using the Kessler 10 Psychological Distress Scale (K10), the Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire short version (TEMPS-A) and the Attachment Style Questionnaire (ASQ).

In our sample (n = 500), 62% of the individuals reported no likelihood of psychological distress, whereas 19.4% and 18.6% displayed mild and moderate-to-severe likelihood. Cyclothymic (OR: 1.24; p < 0.001), depressive (OR: 1.52; p < 0.001) and anxious (OR: 1.58; p = 0.002) temperaments, and the ASQ "Need for approval" (OR: 1.08; p = 0.01) were risk factors for moderate-to-severe psychological distress compared to no distress, while the ASQ "Confidence" (OR: 0.89; p = 0.002) and "Discomfort with closeness" were protective (OR: 0.92; p = 0.001). Cyclothymic (OR: 1.17; p = 0.008) and depressive (OR: 1.32; p = 0.003) temperaments resulted as risk factors in subjects with moderate-to-severe psychological distress compared to mild distress, while the ASQ "Confidence" (OR: 0.92; p = 0.039) and "Discomfort with closeness" (OR: 0.94; p = 0.023) were protective.

Our data indicated that a relevant rate of individuals may have experienced psychological distress following the COVID-19 outbreak. Specific affective temperament and attachment features predict the extent of mental health burden. To the best of our knowledge, these are the first data available on the psychological impact of the early phase of the COVID-19 pandemic on a sizeable sample of the Italian population. Moreover, our study is the first to investigate temperament and attachment characteristics in the psychological response to the ongoing pandemic. Our results provide further insight into developing targeted intervention strategies.

1. Introduction

The coronavirus disease 2019 (COVID-19) pandemic has been spreading across Italy for over a month. On March 9th, 2020, the Italian Government implemented several emergency containment measures, including strict limitations on movement on the whole national territory, except for proven work and health reasons. These measures are unprecedented and aim to contain the epidemic after an increase in total deaths of nearly 100% in the 48 h before the Decree (Lazzerini and Putoto, 2020).

The COVID-19 outbreak is currently leading to severe mental health burden in worst-hit countries (Fiorillo and Gorwood, 2020; Kang et al.,

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2020). Containment measures, including self-isolation and social distancing, have a strong impact on the population's daily life and may negatively affect psychological well-being (Brooks et al., 2020). However, mixed evidence is available about the role of inter-individual characteristics and demographics in determining the psychological response of a population facing large-scale stressful events. Hence, it is crucial to detect possible predictors of the psychological impact during the COVID-19 outbreak, in order to implement prompt intervention strategies (Sani et al., 2020).

Temperament refers to early-appearing individual differences in emotional reactivity, is stable across the lifespan, and has strong biological underpinnings. Certain affective temperament traits and related personality constructs might, to some extent, mediate adaptive functioning, e.g., by subserving better coping mechanisms to environmental stressors (Akiskal and Akiskal, 2005; Balestri et al., 2019).

The attachment theory postulates that the intimate bonds built with caregivers very early during infancy are crucial for social and emotional development and provide a template model for enduring patterns of emotional, cognitive and behavioral strategies in adulthood, i.e., adult attachment style (AAS) (Bartholomew and Horowitz, 1991). Stressful situations are thought to activate the attachment system, and evidence supports the existence of a relationship between attachment patterns and stress responsivity during adulthood (Kidd et al., 2011).

To the best of our knowledge, no study has investigated the determinants of psychological response to the ongoing COVID-19 outbreak so far. We hypothesized that temperament and attachment may affect the degree of perceived psychological distress during the COVID-19 pandemic. Therefore, we aimed to evaluate the psychological impact of the COVID-19 outbreak on the Italian general population and to analyze the affective temperament and AAS as potential predictive factors influencing the extent of psychological burden.

2. Materials and methods

2.1. Participants and procedure

The study was conducted through an online survey between April 10th and April 13th, 2020. This timeframe was chosen to assess participants' response during an early phase of the COVID-19 outbreak, following the Italian Government declaration of lockdown (Decree of March 9th, 2020) and the World Health Organization (WHO) announcement of the COVID-19 as a pandemic (March 11th, 2020). The snowball sampling method was used to recruit participants (Goodman, 1961). We selected an initial set of five subjects, ensuring a broad range of age, gender, occupation, education, and geographical area. Each participant was asked to choose five people they consider suitable for the survey and to send them the questionnaire. Further participants were reached out in the same way until data saturation. Efforts were made to recruit subjects from all Italian regions, which had been affected by the pandemic to different extents, so to have a representative sample of the Italian population. The survey was anonymous, and data confidentiality was assured. Eligible participants were aged 18–75, had lived in Italy for at least four weeks from February 2020, were fluent in both written and spoken Italian, and had at least five years of education. Exclusion criteria were: non-Italian language speakers; current hospitalization; a history of mental disorder. The study followed the European Survey Research Association (ESRA) guidelines. All participants completed the questionnaire online via EUSurvey. The study was approved by the Ethics Committee of the Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore of Rome.

2.2. Data collection

A dedicated, self-report questionnaire was set up to collect demographic and epidemiological variables of interest (age, gender,

educational level, occupation, marital status, geographical area), medical status (lifetime history of chronic diseases, family history of psychiatric disorders), and information on lockdown conditions (living alone, changes in working activities, working on the frontline, and having direct contact with confirmed cases of COVID-19 infection).

2.3. Psychometric assessment

The Kessler 10 Psychological Distress Scale (K10; Kessler et al., 2002) was used to assess the psychological impact of the COVID-19 outbreak. K10 is a 10-item questionnaire intended to yield a global measure of distress experienced in the most recent 4-week period. We adopted the cutoff scores of > 19 and > 24 to detect the likelihood of mild and moderate-to-severe psychological distress, respectively (Andrews and Slade, 2001).

Affective temperaments (cyclothymic, depressive, irritable, hyperthymic, and anxious) were assessed through the short version of the validated Italian Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire (TEMPS-A; Preti et al., 2010).

AAS was evaluated through the Italian validated version of the Attachment Style Questionnaire (ASQ; Fossati et al., 2003), a self-report instrument containing 40 items. The ASQ comprises five subscales: (1) "Confidence", describing secure attachment; (2) "Discomfort with closeness" and (3) "Relationships as secondary", both measuring attachment avoidance; (4) "Need for approval", and (5) "Preoccupation with relationships", both assessing attachment anxiety.

2.4. Statistical analysis

Previous sensitivity analysis suggested that with n = 500 the power was = 0.9 to detect a minimally interesting effect size of δ = 0.2 (α = 0.05; two-tailed). To fit our aims, we subdivided our sample into three groups according to K10 cutoffs: 1) subjects without likelihood of psychological distress, 2) subjects with likelihood of mild psychological distress, and 3) subjects with likelihood of moderate-to-severe psychological distress. Analyses used standard univariate/bivariate comparisons of continuous measures (ANOVA) and categorical measures (contingency table/χ^2) to compare factors of interest (including sociodemographic, AAS, and temperament characteristics) in the three groups. We used a statistical model corrected for multiple comparisons according to the Bonferroni procedure (p < 0.05/number of comparisons) to minimize the likelihood of type I statistical errors. Factors significantly associated with mild or moderate-to-severe psychological distress in bivariate analyses subsequently underwent a multiple multivariate logistic regression to generate Odds Ratios (ORs) and their 95% Confidence Intervals (CIs), with no psychological distress risk/ mild psychological distress/ and moderate-to-severe psychological distress as dependent outcome measures. We examined possible multicollinearity between variables of interest by ensuring that the variance inflation factor (VIF) indicator obtained from linear regression analysis was < 4. We used the statistical routines of SPSS Statistics 24.0 for Windows (IBM Co., Armonk, New York, USA).

3. Results

In our sample (n = 500), 310 subjects (62%) reported no likelihood of psychological distress, whereas 97 (19.4%) and 93 (18.6%) displayed mild and moderate-to-severe likelihood of psychological distress, respectively. Sociodemographic and epidemiological characteristics, as well as results of the univariate/bivariate analysis of temperament and AAS features of the sample, are summarized in Table 1. The three groups differed only in gender (χ^2 = 7.08; p = 0.029) and age (χ^2 = 22.55; p = 0.004). ANOVAs revealed significant differences among the three groups regarding cyclothymic (F = 54.03; p < 0.001), depressive (F = 63.98; p < 0.001), irritable (F = 11.43; p < 0.001), and anxious temperaments (F = 26.87; p < 0.001). The

Table 1
Sociodemographic and psychometric characteristics.

Characteristics (n,%)	Total	No psychological distress	Mild psychological distress	Moderate-to-severe psychological distress	χ^2 or F	df	p
Overall	500	310 (62)	97 (19.4)	93 (18.6)			
Age					22.55	8	**0.004**
18-27	116 (23.2)	60 (19.4)	25 (25.8)	31 (33.3)			
28-37	129 (25.8)	71 (22.9)	28 (28.9)	30 (32.3)			
38-47	83 (16.6)	53 (17.1)	17 (17.5)	13 (14)			
48-57	81 (16.2)	55 (17.7)	13 (13.4)	13 (14)			
> 57	91 (18.2)	71 (22.9)	14 (14.4)	6 (6.4)			
Gender					7.08	2	**0.029**
Female	298 (59.6)	171 (55.2)	67 (69.1)	60 (64.5)			
Male	202 (40.4)	139 (44.8)	30 (30.9)	33 (35.5)			
Educational level					2.55	2	0.279
≤ Undergraduate	147 (29.4)	99 (31.9)	25 (25.8)	23 (24.7)			
≥ Graduate	353 (70.6)	211 (68.1)	72 (74.2)	70 (75.3)			
Occupation					3.44	4	0.486
Student	72 (14.4)	40 (12.9)	13 (13.4)	19 (20.4)			
Employed	350 (70)	221 (71.3)	68 (70.1)	61 (65.6)			
Unemployed	78 (15.6)	49 (15.8)	16 (16.5)	13 (14)			
Marital status					5.5	2	0.064
Married	181 (36.2)	124 (40)	27 (27.8)	30 (32.3)			
Unmarried	319 (63.8)	186 (60)	70 (72.2)	63 (67.7)			
Geographic location					4.55	4	0.336
Northern Italy	112 (22.4)	71 (22.9)	17 (17.5)	24 (25.8)			
Central Italy	211 (42.2)	133 (43)	37 (38.1)	41 (45.1)			
Southern Italy and Islands	177 (35.4)	106 (34.3)	43 (44.3)	28 (30.8)			
Lifetime history of chronic disease	148 (29.6)	93 (30)	31 (32)	24 (25.8)	0.92	2	0.63
Family history of psychiatric disorders	67 (13.4)	46 (14.8)	8 (8.2)	13 (14)	2.8	2	0.247
Living alone	70 (14)	38 (12.3)	18 (18.6)	14 (15.1)	2.54	2	0.281
Changes in working activities	439 (87.8)	275 (88.7)	84 (86.6)	80 (86)	0.64	2	0.724
Working on frontline	128 (25.6)	85 (27.4)	20 (20.6)	23 (24.7)	1.84	2	0.399
Contact with COVID-19 + case	65 (13)	40 (12.9)	9 (9.3)	16 (17.2)	2.64	2	0.267
Psychometric assessment (M ± SD)							
TEMPS-A Cyclothymic	3.78 (3.17)	2.75 (2.54)	4.41 (2.98)	6.54 (3.44)	54.03	2	**< 0.001**
TEMPS-A Depressive	2.1 (2.21)	1.33 (1.66)	2.5 (1.98)	4.26 (2.49)	63.98	2	**< 0.001**
TEMPS-A Irritable	1.16 (1.45)	0.91 (1.25)	1.53 (1.62)	1.63 (1.7)	11.43	2	**< 0.001**
TEMPS-A Hyperthymic	4.39 (2.39)	4.59 (2.05)	4.24 (2.2)	3.87 (2.01)	4.76	2	0.01
TEMPS-A Anxious	1.46 (1.09)	1.2 (1.04)	1.79 (0.99)	1.99 (1.07)	26.87	2	**< 0.001**
ASQ Confidence	33.2 (5.36)	34.45 (4.73)	32.6 (4.91)	29.59 (6.05)	27.15	2	**< 0.001**
ASQ Discomfort with closeness	37.5 (7.67)	36.5 (7.24)	38.66 (7.64)	39.82 (8.24)	7.63	2	**< 0.001**
ASQ Relationships as secondary	15.7 (5.46)	15.31 (5.55)	15.73 (5.1)	16.84 (5.39)	2.82	2	0.06
ASQ Need for approval	21 (6.54)	18.94 (5.6)	22.62 (6.03)	26.05 (6.76)	49.11	2	**< 0.001**
ASQ Preoccupation with relationships	29.1 (6.32)	27.44 (5.9)	31.07 (5.83)	32.29 (6.39)	29.1	2	**< 0.001**

Significant results in **bold** (after Bonferroni correction for multiple comparisons). Abbreviations: M, mean; SD, standard deviation; df, degrees of freedom; χ^2, chi-squared test; *p*, statistical significance; F, value of variance of the group means; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire; ASQ, Attachment Style Questionnaire.

three groups also differed in several ASQ dimensions, including "Confidence" (F = 27.15; p < 0.001), "Discomfort with closeness" (F = 7.63; p < 0.001), "Need for approval" (F = 49.11; p < 0.001), and "Preoccupation with relationships" (F = 29.1; p < 0.001). Multinomial logistic regression identified anxious temperament (OR: 1.39; p = 0.008) as a risk factor for mild psychological distress compared to no psychological distress, whereas male gender (OR: 0.5; p = 0.012) was protective. Cyclothymic (OR: 1.24; p < 0.001), depressive (OR: 1.52; p < 0.001) and anxious (OR: 1.58; p = 0.002) temperaments, and the ASQ "Need for approval" (OR: 1.08; p = 0.01) were risk factors for moderate-to-severe psychological distress as compared to no distress, while the ASQ "Confidence" (OR: 0.89; p = 0.002) and "Discomfort with closeness" subscales were protective (OR: 0.92; p = 0.001). Lastly, cyclothymic (OR: 1.17; p = 0.008) and depressive temperaments (OR: 1.32; p = 0.003) were identified as risk factors when comparing subjects with moderate-to-severe psychological distress to individuals with only mild distress, whereas both the ASQ "Confidence" (OR: 0.92; p = 0.039) and "Discomfort with closeness" (OR: 0.94; p = 0.023) subscales were protective (Table 2; see also Fig. A.1 in Supplementary material).

4. Discussion

The documented connection between viral epidemics and psychological distress dates back more than 100 years ago, when Menninger linked the 1918 Spanish flu pandemic with psychiatric complications (Menninger, 1919). People's emotional responses during massive infectious disease outbreaks are likely to include feelings of extreme fear and uncertainty that, along with the separation from loved ones and the limitations on freedom, may eventually lead to dramatic mental health burden (Brooks et al., 2020). Hence, we conducted a survey to investigate the Italian population's psychological response during an early phase of the epidemic. Our findings indicate that 38% of the general population is currently perceiving a form of psychological distress. Similar results were observed both in online surveys conducted on the Chinese population during the COVID-19 pandemic (Li et al., 2020) and among the Italian general population following previous natural disasters (Dell'Osso et al., 2013). However, the majority of subjects in our sample displayed no relevant distress. This might be due to the still relatively short exposure to the pandemic, as well as to individual features promoting resilience (Mukhtar, 2020).

Table 2
Multiple logistic regression.

	OR [95% CI]	Wald	*p*
Mild psychological distress vs. No psychological distress			
Gender	0.5 [0.29 0.86]	−2.51	**0.012**
Age	0.99 [0.97 1.01]	−1.2	0.23
TEMPS-A Cyclothymic	1.06 [0.96 1.17]	1.17	0.24
TEMPS-A Depressive	1.15 [0.98 1.35]	1.77	0.08
TEMPS-A Irritable	1.13 [0.94 1.36]	1.34	0.18
TEMPS-A Anxious	1.39 [1.09 1.78]	2.67	**0.008**
ASQ Confidence	0.97 [0.91 1.03]	−1.08	0.28
ASQ Discomfort with closeness	0.98 [0.94 1.02]	−1.01	0.31
ASQ Need for approval	1.05 [1 1.1]	1.82	0.07
ASQ Preoccupation with relationships	1.03 [0.98 1.08]	1.18	0.24
Moderate-to-severe psychological distress vs. No psychological distress			
Gender	0.58 [0.31 1.08]	−1.72	0.08
Age	1 [0.98 1.02]	0.03	0.97
TEMPS-A Cyclothymic	1.24 [1.11 1.38]	3.83	**< 0.001**
TEMPS-A Depressive	1.52 [1.27 1.8]	4.69	**< 0.001**
TEMPS-A Irritable	0.97 [0.78 1.19]	−0.37	0.75
TEMPS-A Anxious	1.58 [1.12 2.12]	3.06	**0.002**
ASQ Confidence	0.89 [0.83 0.96]	−3.13	**0.002**
ASQ Discomfort with closeness	0.92 [0.88 0.97]	−3.21	**0.001**
ASQ Need for approval	1.08 [1.02 1.15]	2.58	**0.01**
ASQ Preoccupation with relationships	0.98 [0.92 1.04]	−0.54	0.59
Moderate-to-severe psychological distress vs. Mild psychological distress			
Gender	1.15 [0.58 2.25]	0.4	0.69
Age	1.01 [0.99 1.03]	0.98	0.32
TEMPS-A Cyclothymic	1.17 [1.04 1.31]	2.66	**0.008**
TEMPS-A Depressive	1.32 [1.1 1.58]	2.99	**0.003**
TEMPS-A Irritable	0.86 [0.69 1.05]	−1.47	0.14
TEMPS-A Anxious	1.14 [0.83 1.55]	0.8	0.42
ASQ Confidence	0.92 [0.86 0.99]	−2.07	**0.039**
ASQ Discomfort with closeness	0.94 [0.89 0.99]	−2.27	**0.023**
ASQ Need for approval	1.03 [0.97 1.1]	1.02	0.31
ASQ Preoccupation with relationships	0.95 [0.9 1.02]	−1.43	0.15

Significant results in **bold**. Abbreviations: OR, odds ratio; CI, Confidence Interval; *p*, statistical significance; TEMPS-A, Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Autoquestionnaire; ASQ, Attachment Style Questionnaire.

Anxious temperament and male gender represented, respectively, a predictive and protective factor for mild psychological distress. On the one hand, anxious temperament, as a trait-like phenotype, is characterized by increased behavioral and physiological reactivity to mildly stressful stimuli and is more prevalent in women (Akiskal and Akiskal, 2005). On the other hand, gender is an important biological determinant of vulnerability to psychosocial stress, in addition to genetic, socio-cultural, hormonal, and developmental factors (Wang et al., 2007). Our results indicate that males are, to a certain degree, less likely to develop psychological symptoms in the face of a stressful event. Similarly, a recent survey conducted in China one month after the COVID-19 outbreak reported higher post-traumatic stress symptoms in women (Liu et al., 2020).

When comparing subjects with likelihood of moderate-to-severe psychological distress to individuals with no risk, depressive, anxious, and cyclothymic temperaments, as well as the insecure-anxious attachment dimension "Need for approval", appeared to be risk factors. Conversely, the ASQ "Confidence", as well as the ASQ "Discomfort with closeness", dimensions of secure and avoidant patterns of attachment respectively, were protective. The same ASQ subscales were protective also for mild psychological distress, compared to moderate-to-severe distress, whereas cyclothymic and depressive temperaments proved to be predictors.

Depressive temperament is characterized by being pessimistic, highly self-critical, gloomy, prone to excessive worrying and striving to please others, whereas cyclothymic temperament is outlined by shifts in mood, energy, behavior, and thinking. Both cyclothymic and depressive temperaments display increased stress reactivity in daily life, as well as

enhanced desire for social contact (Walsh et al., 2013). Our results suggest that cyclothymic/depressive individuals may be more likely to perceive the COVID-19 outbreak and related containment measures as distressful and to experience increased negative affect in response to social isolation.

In our sample, features of both secure and avoidant AAS appeared to be protective for the risk of higher psychological burden during the COVID-19 outbreak, compared to anxious style. A function of attachment is to regulate distress (Bartholomew and Horowitz, 1991) and evidence suggests that quality of early caregiving experiences and AAS may affect stress responsivity, both at a physiological and psychological level (Kidd et al., 2011). Anxiously/avoidantly attached individuals are less able to regulate their emotions, as opposed to securely attached subjects, so that several strategies have developed internally to reduce or manage any distress experienced. Bartholomew and Horowitz (1991) described anxiously-attached individuals as overly dependent on others and in constant need of attention, in contrast to those high in avoidance who may feel uncomfortable in social interactions. A possible explanation to our results is that while subjects with anxious style over-report distress to ensure care will be provided, individuals with an avoidant attachment may appear as if they are very calm in a distressing situation while their internal experience may be quite the opposite. Alternatively, individuals with prominent avoidant attachment features, who tend to be self-directed, and often do not exhibit distress upon social separation, might perceive self-isolation, as well as social distancing preventive measures, as less stressful compared to anxiously-attached individuals.

Some issues might limit the generalizability of our results. The study was carried out throughout four days and lacks longitudinal follow-up. The impact of the COVID-19 outbreak on the Italian population's mental health could worsen over time and long-term implications warrant further investigation. The survey design involved an online invitation, thus leaving unexplored the population who does not use network devices. Further, we cannot determine the participation rate since it is unclear how many subjects received the survey. Finally, the reliability of self-administered questionnaires may be partially biased.

To the best of our knowledge, our survey results are the first showing that a relevant percentage of the Italian population might have experienced from mild to moderate-to-severe psychological distress symptoms during the early phase of the COVID-19 outbreak, and that both temperament and AAS features may predict the extent of mental health burden. Interventions promoting mental health among the general population should be rapidly implemented, bearing in mind individual background and characteristics.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bbi.2020.04.048.

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